

# Are my existing solar panels compatible with RPS Solar Pumps?

To find out, send our engineers a quick email at [sizing@ruralpowersystems.com](mailto:sizing@ruralpowersystems.com) with the following info:

- 1) Stats from the sticker on the back of your solar panels  
**Total Power (watts), Vmp (volts), Voc (volts)**
- 2) The total number of panels you have



Example: RPS 100w "12v Panel"

## Solar Panel Sticker

(on reverse side under junction box)

### Stats you'll need from the sticker..

- Total Power ( **Pm**, Watts )
- Voltage Maximum Power ( **Vmp**, Volts DC )
- Voltage Open-Circuit ( **Voc**, Volts DC )

### Optional stats:

- Current Maximum Power ( **Imp**, in Amps )
- Short-Circuit Current ( **Ioc**, in Amps )

Most Common Sizes	
"12V Panels"	"24V Panels"
Each panel is different but in general.. <b>Vmp</b> is 16v - 20v <b>Voc</b> is ~20v - 23v	Each panel is different but in general.. <b>Vmp</b> is 30v to 37v <b>Voc</b> is ~38v to 45v
<b>Example</b> RPS 100w Panels Vmp = 18.6v Voc = 21.8v	<b>Example</b> RPS 290w Panels Vmp = 32.1v Voc = 38.8v


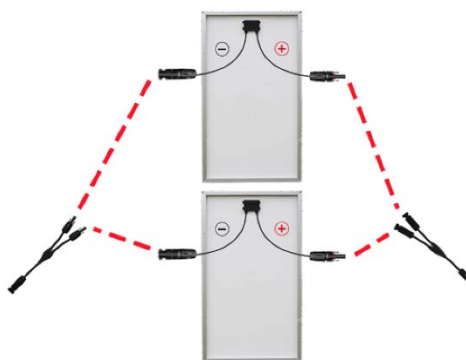


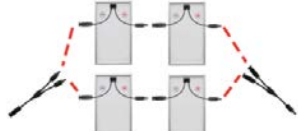
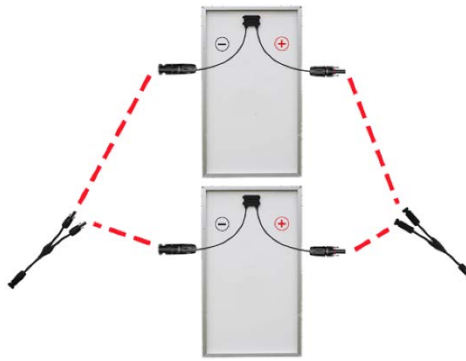

$P = I \times V$  (Power = Current x Voltage)  
1 horsepower (hp) = 745 watts

## RPS Solar Pump System Requirements

	RPS 200, 400, 600, 800	RPS 400V, `800V	Tankless Pressure Pump	RPS Pro Series Pumps
<b>Min Solar Array Voltage</b>	24v DC	48v DC	24v DC	100v DC
<b>Max Solar Array Voltage</b>	<b>72 Vmp</b> <b>90 Voc</b>	<b>72 Vmp</b> <b>90 Voc</b>	<b>36 Vmp</b> <b>45 Voc</b>	<b>360 Vmp</b> <b>410 Voc</b>
<b>Optimal Solar Array Voltage</b>	<b>24v / 36v / 48v</b> (36-72 Vmp)	<b>48v</b> (72 Vmp)	<b>24v</b> (30-36 Vmp)	260-320 Vmp
<b>Examples Arrays</b>	<b>Examples</b> 2x 100w 12v panels in series (24v) 1x 300w 24v panel (24v) 2x 180w 24v panels in parallel 4x 100w 12v in series/parallel (24v) 3x 100w 12v panels in series (36v) 4x 100w 12v panels in series (48v)	<b>Examples</b> 4x 100w 12v panels in series (48v) 8x 100w 12v in series/parallel (48v) 2x 300w 24v panel in series (48v)	<b>Examples</b> 2x 100w 12v panels in series (24v) 1x 300w 24v panel (24v) 2x 180w 24v panels in parallel (24v)	<b>Examples</b> 16x 100w 12v in series (288 Vmp) 10x 290w 24v in series (320 Vmp)
<b>Pump Wattage / Coefficient</b>	Recommend 1.3x or more	Recommend 1.3x or more	Recommend 400 Watts or more	Recommend 1.3x or more
<b>Battery Bank Voltage</b>	Must be same as solar array voltage. (Compatible 24v, 36v, 48v)	Must be same as solar array voltage. (Ideally 48v)	24v Only	Not designed for batteries. Use backup of generator or grid 1 Ph 220v.

## Wiring Diagrams Common to Solar

"Series"	"Parallel"	"Series / Parallel"
Add voltage of every solar panel or battery in series, current stays the same. All the solar panels must be the same. $12v + 12v + 12v + 12v = 48v$	Add current of every solar panel or battery in parallel, voltage stays the same. All the solar panels must be the same. $12v // 12v = 12v$	Add voltage of every solar panel or battery in series, voltage stays the same when other sets connected in parallel. $12v + 12v // 12v + 12v = 24v$

Rough Panel Specs	Standard RPS Pumps Voc Max 100V (Ideally 90v)	Pro Series Voc Max 410V (Ideally 400v)
<p><b>350 Watts</b> 40 Vmp 45 Voc</p> <p>“72 Cell Panels”</p>	<p>Wired in Series</p>  <p>1) Check Voc: <math>45v + 45v &lt; 100V</math> ✓ 2) Check Vmp: <math>40v + 40v = 80Vmp</math> 3) Array Specs: <math>350w * 2 = 700w @ 80Vmp</math> <b>Just under RPS 800 performance.</b> <i>Another 2 in parallel would be 1400w @ 80Vmp which is higher than 1200w but usually ok and would be excellent morning and evening performance.</i></p> <p>Wired in Parallel</p>  <p>1) Check Voc: <math>45v &lt; 100V</math> ✓ 2) Check Vmp: <math>40v = 40Vmp</math> 3) Array Specs: <math>350w * 2 = 700w @ 40Vmp</math> <b>Slightly Better than RPS 400 performance.</b> <i>Would be similar GPM as RPS 400 with excellent morning and evening performance.</i></p>	<p>Wired in Series</p>  <p>1) Check Voc: <math>45v * 4 &lt; 410V</math> ✓ 2) Check Vmp: <math>40v * 4 = 160Vmp &gt; 120Vmp</math> ✓ 3) Array Specs: <math>350w * 4 = 1400w @ 160Vmp</math> <b>Just over Pro 1000 performance. Probably not higher.</b></p> <p><b>MAX: Could add as many as 8 in series.</b> <math>45 * 8 &lt; 410V</math></p>
<p><b>200 Watts</b> 30 Vmp 36 Voc</p> <p>“60 Cell Panels”</p>	<p>Wired in Series</p>  <p>1) Check Voc: <math>36v + 36v &lt; 100V</math> ✓ 2) Check Vmp: <math>30v + 30v = 60Vmp</math> 3) Array Specs: <math>200w * 2 = 400w @ 60Vmp</math> <b>Just under RPS 600 performance.</b></p>  <p><i>Another 2 in parallel would be 800w @ 60Vmp and would be excellent morning and evening performance slightly better than RPS 600.</i></p> <p><b>MAX: No more than 2 in series</b> <math>36 * 3 &gt; 100V</math> ✗</p> <p>Wired in Parallel</p>  <p>1) Check Voc: <math>36v &lt; 100V</math> ✓ 2) Check Vmp: <math>30v = 30Vmp</math> 3) Array Specs: <math>200w * 2 = 400w @ 30Vmp</math> <b>Slightly longer than RPS 200 performance in morning and evening performance, likely less GPM with slightly lower voltage.</b></p>	<p>Wired in Series</p>  <p>1) Check Voc: <math>36v * 8 &lt; 410V</math> ✓ 2) Check Vmp: <math>30v * 8 = 240Vmp &gt; 120Vmp</math> ✓ 3) Array Specs: <math>200w * 8 = 1600w @ 240Vmp</math> <b>Right around Pro 1500 performance. Maybe Pro 1000 with 8.</b></p> <p><b>MAX: Could add as many as 8 in series.</b> <math>36 * 11 &lt; 410V</math></p>